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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,444	03/01/2005	Uwe Bernhard Stein	1025-P03582US0	3127

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EXAMINER	
MYERS, JESSICA L	

ART UNIT	PAPER NUMBER
3746	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,444	STEIN ET AL.	
	Examiner	Art Unit	
	JESSICA L. MYERS	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The arguments filed on 7/11/2008 under 37 CFR 1.131 have been entered and considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,651,545 to Nippert (Nippert) in view of U.S. Patent 5,456,581 to Jokela et al. (Jokela et al.).

In Reference to Claim 1

Nippert teaches a fluid-working machine having a plurality of working chambers of cyclically changing volume (see figure 4), a high-pressure fluid manifold and a low-pressure fluid manifold (high and low pressure accumulators (28, 26)), at least one valve (valves (64 and 66)) linking each working chamber to each manifold, and an electronic sequencing controller (controller (24)) for operating said valves in timed relationship with the changing volume of each chamber, wherein the electronic sequencing controller is arranged to operate the valves of each chamber in one of an

idling mode (see column 8 lines 53-67, where piston can be locked in the top dead center position, and thus no fluid is pumped), a partial mode (see column 8 lines 43-47, where only a portion of the regular fluid amount is pumped) in which only part of the usable volume of the chamber is used (only part of the usable volume of fluid is pumped), and a full mode (see column 7, lines 32- 65, where full strokes are discussed) in which all of the usable volume of the chamber is used, and the electronic sequencing controller is arranged to select the mode of each chamber on successive cycles so as to vary the time averaged effective flow rate of fluid through the machine (The apparatus of Nippert would be capable of doing this, since the selection of each piston's mode must occur at some point in time, and each of these points could be considered the start of a cycle. In this way, the apparatus of Nippert chooses the pistons' modes on successive cycles, and the flow rate of the machine would be controlled by this decision.).

Furthermore, although it is believed that the apparatus of Nippert would be capable of selecting the mode of each chamber during each pumping cycle in order to control the output of the pump since the speed of the fluid pump (12) is continuously measured and therefore the output of the pump could be continuously controlled, the apparatus of Jokela et al. is presented as further evidence that it is known in the art to cyclically control the piston strokes of a pump in order to control the pump's flow rate. Jokela et al. teach a similar multi-piston pump where the pistons can either undergo a full pumping stroke or can return unneeded fluid back through the inlet valve (see column 3, lines 44-66). The decision of whether to utilize each individual reciprocating

piston is made cyclically by the microprocessor during each revolution of the drive shaft based on an outlet pressure of the pump (which would correspond to the pump's flow rate) (see columns 4-5 lines 56-19). Thus it would have been obvious to one of ordinary skill in the art at the time of invention to use the control system described by Jokela et al. in the apparatus of Nippert, since Nippert does not disclose the details as to how the pump is controlled, and since Jokela et al. use position sensors to control the pump in a manner similar to Nippert.

In Reference to Claim 2

Nippert as modified by Jokela et al. teaches a machine according to claim 1 (see the rejection of claim 1 above), wherein the partial mode comprises the use of only a small fraction of the usable volume of the chamber (see column 8 lines 26-52, where the pistons only expel fluid during part of the stroke, and thus only a portion of the volume of the chamber is used to pump).

In Reference to Claim 3

Nippert as modified by Jokela et al. teaches a machine according to claim 1 (see the rejection of claim 1 above), operable as both a pump and a motor (see column 2 lines 40-43 of Nippert), each chamber having five selectable modes, namely idling mode (see column 8 lines 53-67, where piston can be locked in the top dead center position, and thus no fluid is pumped), partial motoring mode (similar to partial pumping mode in that only a portion of fluid is used to actuate the motor, but the inlet leads from the high pressure manifold and the outlet leads to the low pressure manifold), full motoring mode (similar to full pumping mode in that a full stroke is performed, but the

inlet leads from the high pressure manifold and the outlet leads to the low pressure manifold, see column 9 lines 46-59), partial pumping mode (see column 8 lines 26-52, where the pistons only expel fluid during part of the stroke, and thus only a portion of the regular fluid amount is pumped) and full pumping mode (see column 7, lines 32-65, where full strokes are discussed).

In Reference to Claim 4

Nippert as modified by Jokela et al. teaches a machine according to claim 1 (see the rejection of claim 1 above), wherein the working chambers comprise cylinders (piston bores (44)) in which pistons are arranged to reciprocate (pistons (46)).

In Reference to Claim 5

Nippert as modified by Jokela et al. teaches a machine according to claim 4 (see the rejection of claim 4 above), wherein partial pumping mode includes closing the valve linking the cylinder to the low-pressure manifold and opening the valve linking the cylinder to the high-pressure manifold a small fraction in advance of the top dead centre position of the piston (Nippert discloses that in partial pumping mode it is possible to pump a first portion of the volume, bypass an intermediate portion, and pump the remaining portion. That is, after the bypassed portion, the high pressure valve would need to open to allow the fluid to be pumped, while the low pressure valve would need to close to prevent the bypass effect.).

In Reference to Claim 6

Nippert as modified by Jokela et al. teaches a machine according to claim 4 (see the rejection of claim 4 above), wherein partial motoring mode includes closing the valve

linking the cylinder to the high-pressure manifold and opening the valve linking the cylinder to the low- pressure manifold a small fraction after the top dead centre position of the piston (Partial motoring mode operates in a manner similar to partial pumping mode. Therefore it would be possible to use a first portion of the volume to create rotary motion, bypass an intermediate portion, and use the remaining portion of the volume to create motion. Thus, after the bypassed portion, the low pressure valve would need to open to allow the fluid to be pumped, while the high pressure valve would need to close to prevent the bypass effect.).

In Reference to Claim 7

Nippert teaches a method of operating a fluid-working machine having a plurality of working chambers of cyclically changing volume (see figure 4), a high-pressure fluid manifold and a low-pressure fluid manifold (high and low pressure accumulators (28, 26)), at least one valve (valves (64 and 66)) linking each working chamber to each manifold, comprising operating the valves of each chamber in one of an idling mode, a partial mode in which only part of the usable volume of the chamber is used, and a full mode in which all of the usable volume of the chamber is used, wherein the mode of each chamber is selected on successive cycles so as to vary the time averaged effective flow rate of fluid through the machine (The controller (24) of the system is capable of choosing which mode each piston is operated in, for a given stroke, based on the speed of the fluid pump (see column 7 lines 3-12). The possible modes consist of a full stroke mode (see column 7, lines 32-65), a partial stroke mode (see column 8 lines 43-47), and an idle mode (see column 8 lines 53-67. The apparatus of Nippert

would be capable of selecting the mode of each piston on successive cycles, since the selection of each piston's mode must occur at some point in time, and each of these points could be considered the start of a cycle. In this way, the apparatus of Nippert chooses the pistons' modes on successive cycles, and the flow rate of the machine would be controlled by this decision.).

Furthermore, although it is believed that the apparatus of Nippert would be capable of selecting the mode of each chamber during each pumping cycle in order to control the output of the pump since the speed of the fluid pump (12) is continuously measured and therefore the output of the pump could be continuously controlled, the apparatus of Jokela et al. is presented as further evidence that it is known in the art to cyclically control the piston strokes of a pump in order to control the pump's flow rate. Jokela et al. teach a similar multi-piston pump where the pistons can either undergo a full pumping stroke or can return unneeded fluid back through the inlet valve (see column 3, lines 44-66). The decision of whether to utilize each individual reciprocating piston is made cyclically by the microprocessor during each revolution of the drive shaft based on an outlet pressure of the pump (which would correspond to the pump's flow rate) (see columns 4-5 lines 56-19). Thus it would have been obvious to one of ordinary skill in the art at the time of invention to use the control system described by Jokela et al. in the apparatus of Nippert, since Nippert does not disclose the details as to how the pump is controlled, and since Jokela et al. use position sensors to control the pump in a manner similar to Nippert.

In Reference to Claim 8

Nippert as modified by Jokela et al. teaches a method according to claim 7 (see the rejection of claim 7 above), wherein the partial mode comprises the use of only a small fraction of the usable volume of the chamber (see column 8 lines 26-52, where the pistons only expel fluid during part of the stroke, and thus only a portion of the volume of the chamber is used to pump).

4. Claims 9 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Nippert as modified by Jokela et al., and in further view of U.S. 5,259,738 to Salter et al. (Salter et al.).

In Reference to Claim 9

Nippert as modified by Jokela et al. teaches a method according to claim 7 (see the rejection of claim 7 above), but does not teach that the number of chambers to be operated is chosen by an algorithm.

Salter et al. teach a similar multi-chambered piston pump apparatus with solenoid actuated valves that control the flow of fluid to each pumping chamber. These valves are actuated by a controller (20) that contains "several built-in algorithms which enable the unit to compare the pump system demand characteristics with system feedback (see column 5 lines 36-55)." The controller's decision to operate each valve occurs every cycle of the pump's operation (see column 6 lines 41-48). It would have been obvious to one of ordinary skill in the art at the time of invention to include control algorithms as taught by Salter et al. in the controller of Nippert as modified by Jokela et

al. since Jokela et al. does not disclose the exact manner in which the controller of Jokela et al. operates, and so that the pumping process could be better automated.

In Reference to Claim 10

Nippert as modified by Jokela et al. and Salter et al. teaches Nippert as modified by Salter et al. teaches a method according to claim 9 (see the rejection of claim 9 above), including a preliminary step of selecting whether to operate the machine as a pump or a motor, and choosing the algorithm accordingly (Since the apparatus cannot be operated as both a pump and a motor at the same time, a decision would need to be made to determine which mode the apparatus would operate in. A pumping algorithm would be necessary when the apparatus is operated in pump mode, and a motoring algorithm would be necessary when the apparatus is operated in motor mode.).

Response to Arguments

5. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/JLM